

AMENDMENTS TO THE CLAIMS

Please cancel claims 4-6, 8-9, 20-25, and amend claims 1, 10 and 30 as set forth in the listing of claims that follows:

1. (Currently Amended) A catalyst performance diagnostics system, comprising:
a plurality of treatment devices, wherein said plurality of treatment devices comprise a first treatment device, a second treatment device, and a third treatment device, and wherein at least two treatment devices comprise a nitrogen oxides adsorber material;
a plurality of gas sensors disposed in fluid communication with said plurality of treatment devices; wherein said plurality of gas sensors comprise a first gas sensor disposed before said first treatment device, a second gas sensor disposed between said second treatment device and said third treatment device, and a third gas sensor disposed after said third treatment device, and
an on-board diagnostic system coupled to said plurality of gas sensors.

2. – 6 (Cancelled)

7. (Previously presented) The catalyst performance diagnostics system of Claim 1, wherein said plurality of gas sensors comprise a gas sensor disposed within a treatment device of said plurality of treatment devices.

8-9 (Cancelled)

10. (Currently Amended) A method for monitoring catalyst performance, comprising:
introducing an exhaust gas stream into an exhaust system that includes a plurality of treatment devices and a plurality of gas sensors disposed in fluid communication with said plurality of treatment devices, wherein said plurality of treatment devices comprises a first treatment device, a second treatment device, and a third treatment device, and said plurality of gas sensors comprise a first gas sensor disposed before said first treatment device, a second gas sensor disposed between said second treatment device and said third treatment device, and a

third gas sensor disposed after said third treatment device, and further wherein at least two treatment devices comprise a nitrogen oxides adsorber material;

monitoring said exhaust gas stream using a said plurality of gas sensors;

passing said exhaust gas stream through a said plurality of treatment devices;

~~wherein at least two treatment devices comprise a nitrogen oxides adsorber material;~~

measuring a first response time differential between said first gas sensor and said second gas sensor, and a second response time between said first gas sensor and said third gas sensor plurality of gas sensors; and

desulfating said treatment devices based upon said first response time and said second response time.

11. (Original) The method of Claim 10, further comprising monitoring said plurality of gas sensors using an on-board diagnostic system.

12. (Original) The method of Claim 10, wherein said desulfating further comprises adjusting an air to fuel ratio to regenerate a catalyst material of one or more of said treatment devices.

13. (Original) The method of Claim 10, wherein said measuring further comprises collecting a plurality of responses by an on-board diagnostic system, wherein said responses further comprise a response time differential between a first gas sensor and a second gas sensor, a response time differential between said second gas sensor and a third gas sensor, and a response time differential between said first gas sensor and said third gas sensor.

14. (Original) The method of Claim 10, further comprising calculating a sulfur contamination index based upon said response time differentials between said plurality of gas sensors.

15. (Previously presented) The method of Claim 14, wherein said measuring further comprises measuring said response time differentials between said plurality of gas sensors to calculate a sulfur contamination index.

16. (Original) The method of Claim 14, wherein said three sulfur contamination indices further comprise a first sulfur contamination index based on a first gas sensor and a third gas sensor, a second sulfur contamination index based on a second sensor and said third sensor, and a third contamination index based on said first sensor and said second sensor.

17. (Original) The method of Claim 10, further comprising measuring a nitrogen oxide storage capacity of one or more of said treatment devices.

18. (Original) The method of Claim 17, further comprising determining a nitrogen oxide conversion efficiency of said one or more treatment devices.

19. (Original) The method of Claim 18, further comprising using said nitrogen oxide conversion efficiency of said one or more treatment devices to determine whether said treatment devices are experiencing sulfur poisoning.

20-25 (Cancelled)

26. (Previously presented) A catalyst performance diagnostics system, comprising:

a plurality of treatment devices, wherein said plurality comprises a first treatment device, a second treatment device, and a third treatment device;

a plurality of gas sensors disposed in fluid communication with said plurality of treatment devices, wherein said plurality of gas sensors comprise a first gas sensor disposed before said first treatment device, a second gas sensor disposed between said second treatment device and said third treatment device, and a third gas sensor disposed after said third treatment device; and

an on-board diagnostic system coupled to said plurality of gas sensors.

27. (Previously presented) The catalyst performance diagnostics system of Claim 26, wherein at least one of said gas first sensor, said gas second sensor, and said third gas sensor is a NO_x sensor.

28. (Previously presented) The catalyst performance diagnostics system of Claim 27, wherein said first and said second gas sensors are stoichiometric switch sensors.

29. (Previously presented) The catalyst performance diagnostics system of Claim 27, wherein said third gas sensor is a NO_x sensor.

30. (Currently amended) The catalyst performance diagnostics system of Claim 14, wherein said plurality of treatment devices comprise a particulate matter filter or an exhaust treatment device comprising a nitrogen oxides adsorber material disposed after said upstream gas sensor and disposed before another exhaust treatment device of said plurality of treatment devices.

31. (Previously presented) The catalyst performance diagnostics system of Claim 30, wherein said plurality of gas sensors comprises a downstream gas sensor disposed after said at least two treatment devices.